

Detroit transect

an interim account for the Knight Foundation
by Marc Downie and Paul Kaiser
10 September 2013

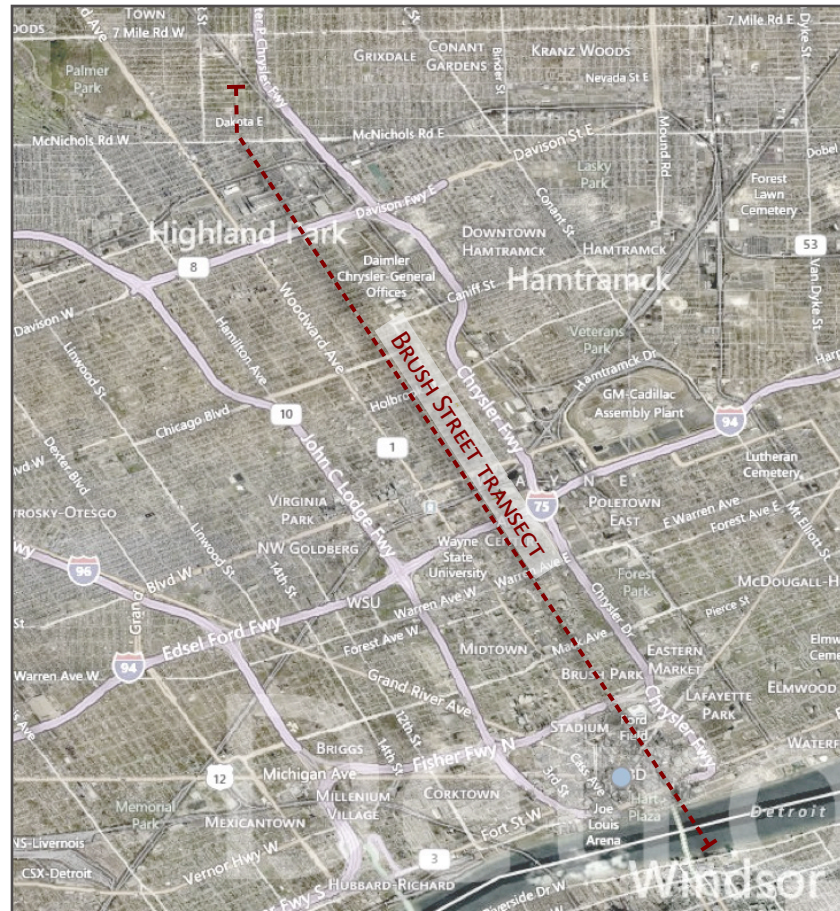
This seems an opportune time to catch you up with the state of our project, which has grown in ambition and scope.

It's also gained a new name — *Detroit transect* — to designate the cluster of inter-related pieces we're busy creating.

In this interim account you'll find:

- an illustrated tour of how we've surveyed, captured, and aligned the present and past of the transect (*pp* 2–31).
- a summary of the remaining work we face (32).
- an account of the range of outcomes we are approaching (33).
- the questions we ponder about how best to show, share, and distribute the resulting works (34).

TRANSECT CHOSEN: THE LINE FORMED BY BRUSH STREET



For the transect, we chose the line roughly traced by Brush Street.*

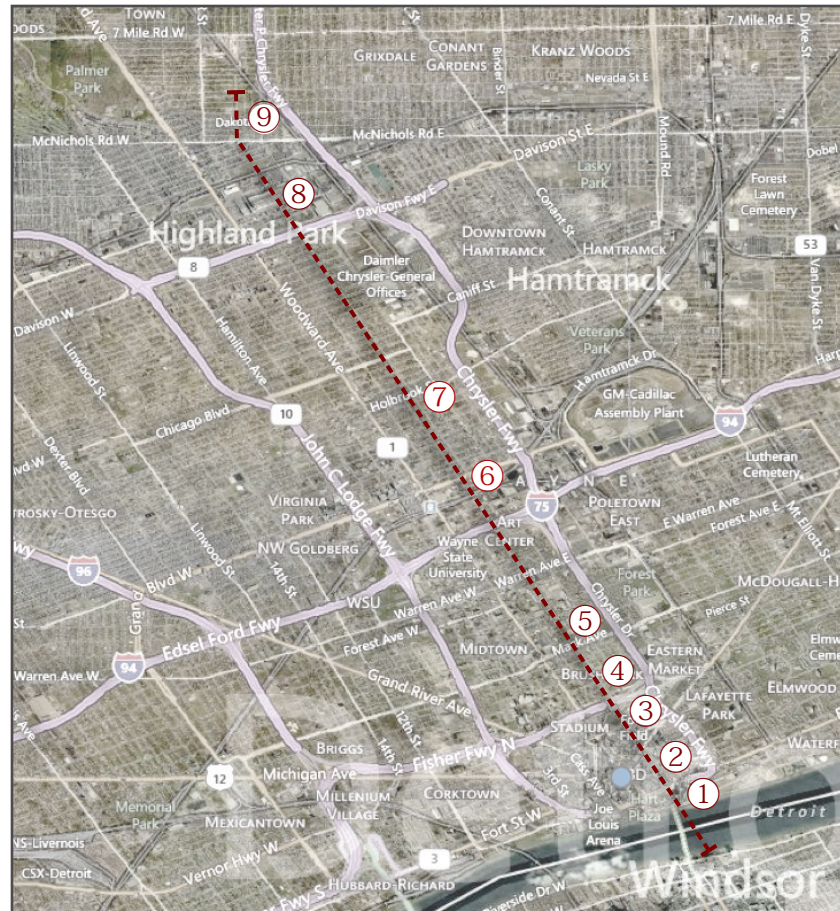
A relatively small road running two blocks east of Detroit's main Woodward Avenue thoroughfare, Brush Street starts just short of the Detroit River downtown and peters out in Highland Park.

Though an unremarked-upon route, Brush Street traverses some of the most significant and/or telling sectors of the city along its nearly seven-mile length.

* We in fact extended the line across the river via the Windsor Tunnel and circumvent interruptions created by two highways and the Highland Park Ford plant. We also follow the kink at its northernmost tip, as it adjusts to a different street grid).

KEY POINTS OF INTEREST

- ① **RENAISSANCE CENTER.** Now General Motors' world headquarters, this strikingly odd office and commercial complex (outmodedly modern) stands on landfill carted over when Detroit's last fort was taken down. The RenCen site was once a thriving railroad and shipping hub.
- ② **GERMANTOWN.** In this mixed neighborhood of offices and apartments, parking lots occupy many places where buildings once stood. Not long ago, it was a legal and administrative center, as signalled by the still-impressive but now vacant Wayne County building. Earlier it was a district of tinkers, whose mechanical ingenuity led to Detroit's supremacy in cars and motors.
- ③ **STADIUMS / FISHER HIGHWAY.** The football and baseball stadiums draw large crowds of white suburbanites, transforming this largely deserted area for the few hours around home games. The Fisher Highway provides quick access to these sporting attractions; the construction of its interchange with the Chrysler Freeway helped obliterate the Hastings Street neighborhood, which at the time was the center of Black cultural life.
- ④ **BRUSH PARK.** Here, in the shadow of downtown, stand a few Victorian houses amid vacant lots given over to wildflowers and pheasants — a photogenic site of lost grandeur and a favorite of "ruin porn" photographers. Brush Park set the original and regrettable pattern for Detroit's well-to-do: created as an exclusive enclave for the rich, it was quickly abandoned for areas ever further removed from the city center.



- ⑤ **DETROIT MEDICAL CENTER.** This expanding cluster of hospitals is a bustling and prosperous city-within-a-city. Harper Hospital, the oldest of the hospitals, was formed by ex-Army surgeons returning to Detroit following the Civil War.
- ⑥ **MILWAUKEE JUNCTION.** Currently a half-abandoned neighborhood traversed by a still-functioning railroad line, this was once home to Detroit's earliest car factories. Ford invented the Model T half a block away on Piquette Street.
- ⑦ **CENTRAL WOODWARD.** Typifying vast swathes of the city, life goes on in households that are in various states of repair and liquidity. But interspersed among these homes are abandoned and decaying houses as well as vacant lots now reverting to the landscape's original prairie condition.
- ⑧ **HIGHLAND PARK FORD PLANT.** The site where Ford first perfected automobile mass production, some of the buildings are now subleased by Ford to other manufacturers, though the vast lot in back is now given over to rusting cars and car parts as well as to a salvage business.
- ⑨ **GREENFIELD ELEMENTARY SCHOOL.** Just before the terminus of Brush Street out in Highland Park stands this recently abandoned elementary school. With large classrooms and a once-beautiful theater and gymnasium, the solid brick building had been built for the ages, but its broken windows now look out on what is quickly turning to countryside.

STRUCTURAL SPINE



The structural spine of DETROIT TRANSECT aligns to a uniform geographic grid *all* its varied types of data — whether captured in the field or gathered from archives or accessed online.

This structure insures that we never lose our bearings as we shuttle across the line both in time and in space, moving fluidly between different types of representation as we go.

GEOGRAPHIC ALIGNMENT OF DATA

— **PRESENT** and **PAST**



PHOTOGRAPH



3D RECONSTRUCTION



3D CAR VIDEO: west



3D CAR VIDEO: east



3D CAR VIDEO: front



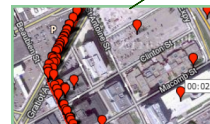
CENSUS BLOCK DATA



3D HAND-HELD VIDEO



3D FIXED-POSITION VIDEO



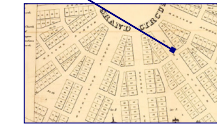
WIFI NETWORKS



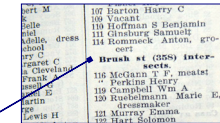
3D HELICOPTER VIDEO



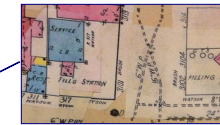
3D MONORAIL VIDEO



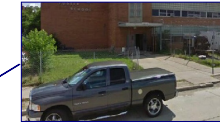
1930 CITY PLAN



1938 STREET DIRECTORY



1912 INSURANCE ATLAS



GOOGLE STREET-VIEW



1800S PRINT

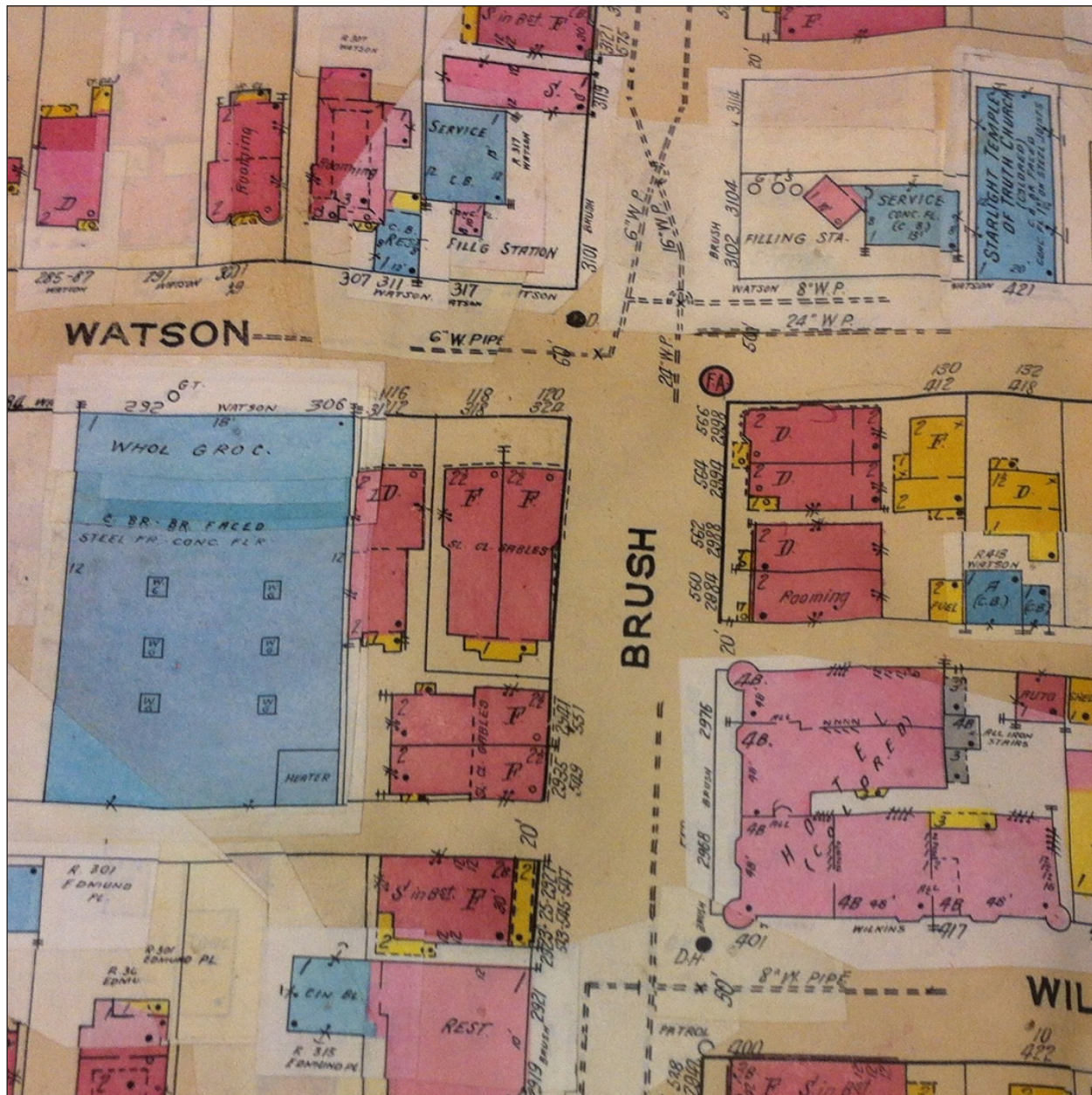


1967 RIOT DIAGRAM



1940S AERIAL PHOTO

ALIGNMENT EXAMPLE — SANBORN INSURANCE ATLAS



The Sanborn maps are an instance of exemplary information collection in the analogue age, surpassing in certain respects the digital mapping information we now have at our fingertips.

Each page of this massive multi-volume series depicts roughly four blocks of the city, identifying each structure by name and each type of building material by color code.

A complete set of the atlas is in the maps collection of the University of Michigan, where we were able to scan all pages that map Brush Street at extremely high resolution (9,000 x 10,000 pixels).

6

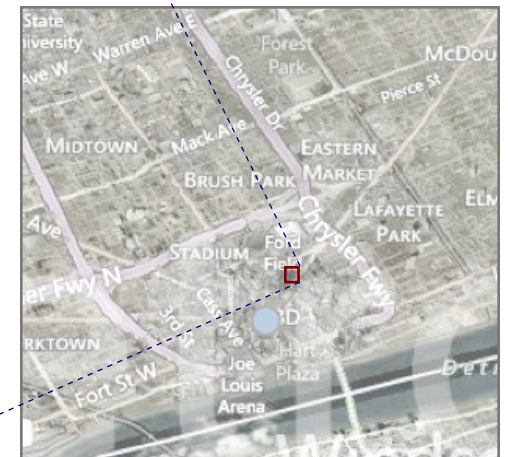


END

The relevant pages are now stitched together to trace Brush Street from start to end.



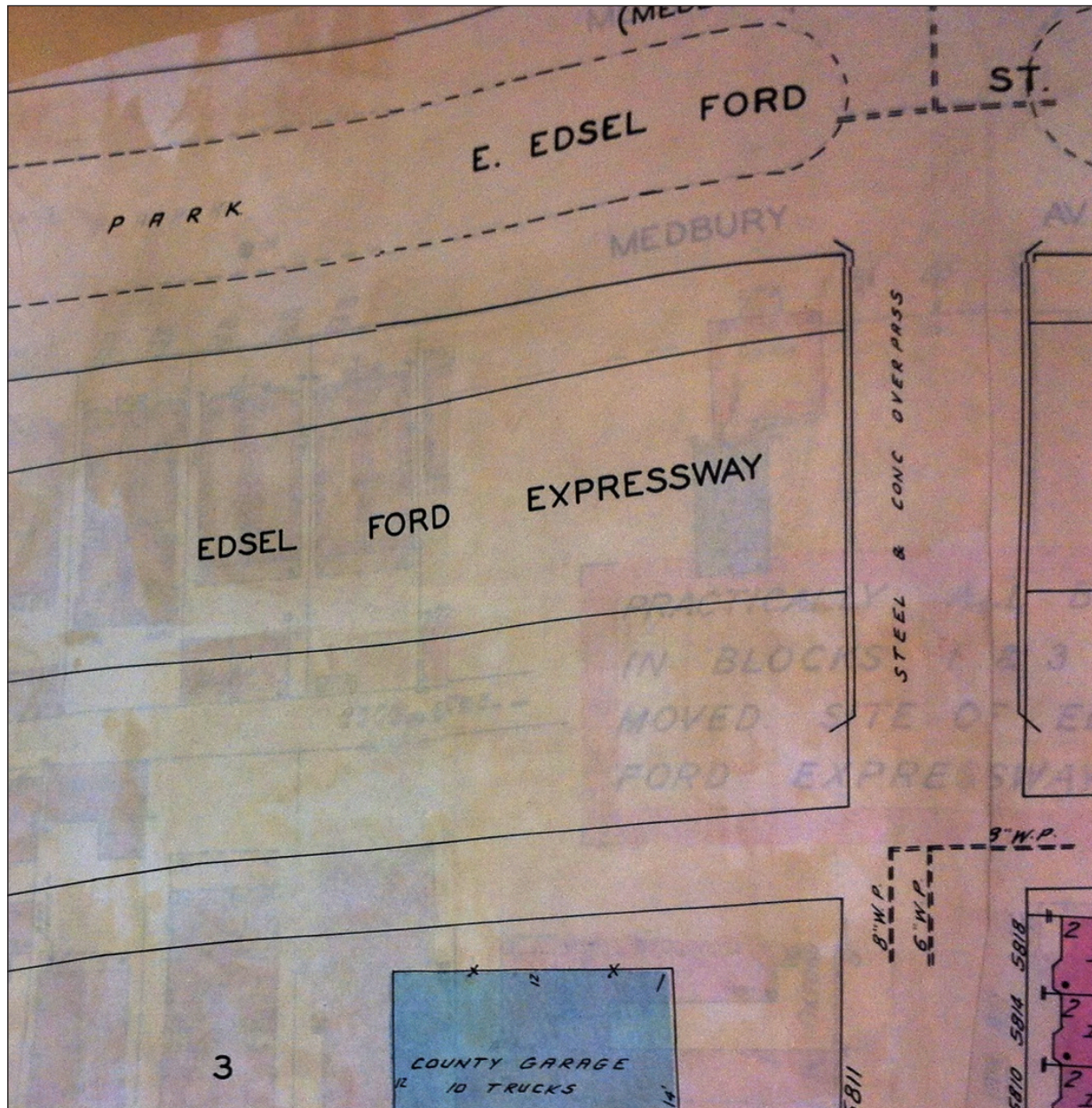
START





Each Sanborn page is precisely aligned to a contemporary digital map.

Here we align the page to an Open-StreetMaps map, but with equal ease we can align to Google Maps as well.



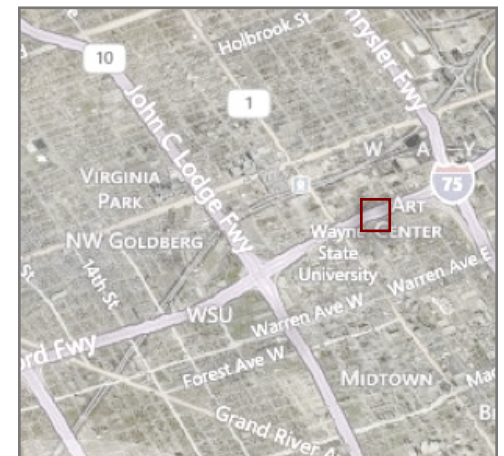
The Sanborn volumes for Detroit were begun in the early 1900s.

Instructions for updating the maps were sent to subscribers, who then pasted updated overlays onto the original pages.

Since the overlays were not completely opaque, the volumes are palimpsests in which past states of the city peek through later ones.

In this case, we see the buildings obliterated when the Edsel Ford Expressway cut a new channel for cars across the city.

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3D SURVEY



A very thorough 3D capture of Brush Street was accomplished from a diversity of vantage points.

Among these vantage points were, in counter-clockwise order: from a car; from a helicopter; and from a 5th floor hotel window.



1



HELICOPTER

Over the course of a 90 minute flight on a chartered helicopter, we captured the full length of Brush Street from both sides.

Our route took us south along the west side, circled around the Renaissance Center over the river, and then returned back up the east side.

The result is a comprehensive aerial survey and 3d capture of our line.

Pictured here are the southern and northern extremes of the transect — (1) the Renaissance Center downtown and (2) the abandoned Greenfield Elementary School in Highland Park.

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2





circling downtown— from Brush Park to sports stadiums to Renaissance Center to river

1



CAR

Only in Detroit can you drive on a single road for nearly seven miles at 4 miles per hour.

We drove north on Brush Street for its full length more than a dozen times, for purposes first of study and then of capture.

For capture by car, we mounted our camera rig alternately on the front, left, and right sides of the rented SUV.

Pictured here are two frontal views:

- (1) Brush Park;
- (2) Milwaukee Junction.

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2





Highland Park neighborhood — side views (on this & next page)





FRAME 2



FRAME 1



LEFT EYE



RIGHT EYE

3D COMPUTED FROM 2D VIDEO

The side views taken from the car will all be in 3D despite being recorded with a single camera — a comparatively inexpensive scientific camera that has superb optics and (what is rare at an affordable price) a non-rolling shutter.

Since we recorded our video from a very slowly moving car, however, each frame overlaps the next frame considerably, which allows us to back out a 3D image, as illustrated here.

There is just enough disparity between successive frames as to approximate the disparity between left and right eyes, which is the basis for stereoscopic perception.

By aligning and then trimming the two separate frames, we can synthesize a 3d image.

We do so automatically using computer vision techniques implemented in our open source software platform Field.



ELEVATED VIEWS

For elevated views lower than that of the helicopter, we filmed extensively (1) from the PeopleMover monorail.

In addition we captured scenes from (2) a 5th floor hotel window, as well as from the top of the Renaissance Center, from the tops of many parking structures, from offices and outdoor elevators in the Detroit Medical Center, and from the roof of the Greenfield Elementary School at the end of the transect.





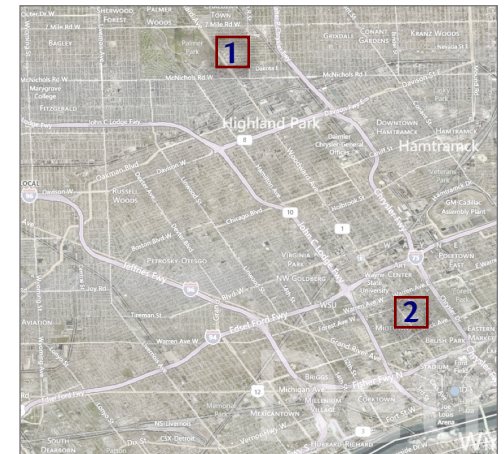
HAND-HELD CAMERA INTERIORS

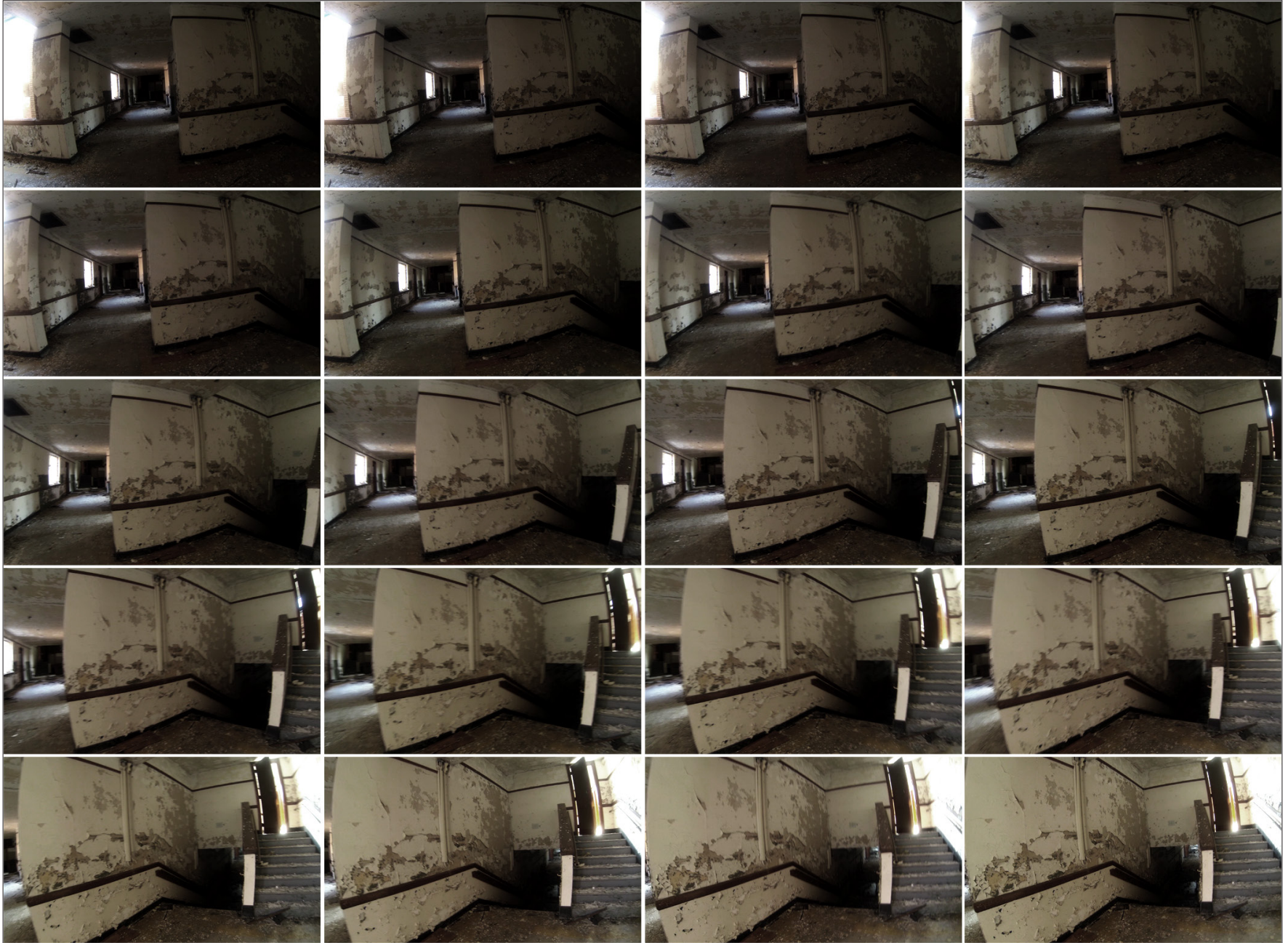
Many interiors were captured with a small hand-held 3D camera rig of our own making, which allowed us to roam fairly unobtrusively through interior spaces.

Pictured here are two contrasting views:

(1) the vacant and vandalized Greenfield Elementary School in Highland Park;

(2) an underground corridor running underground between state-of-the-art radiology facilities at the Detroit Medial Center.







CORNERING

To capture Brush Street's corners and side streets, we snaked between the two roads parallel to Brush on either side (which are John St. and Beaubien streets for most of the route) as we drove up the full length of the road.

Pictured here is another abandoned elementary school in Highland Park.





NIGHT VIEW

We chose a contrasting route that intersects Brush Street downtown — following Gratiot into downtown and then Michigan Avenue out, a line that traces the original Native American footpaths that predated the city.

Detroit at night is distinctively different from other American cities not only because of its many vacant lots but also its many broken lights.

Our method takes a large number of short exposures at high frame-rate and then eliminates their inevitable noise by synthesizing artificially long exposures, producing haunting frames like those seen at left.

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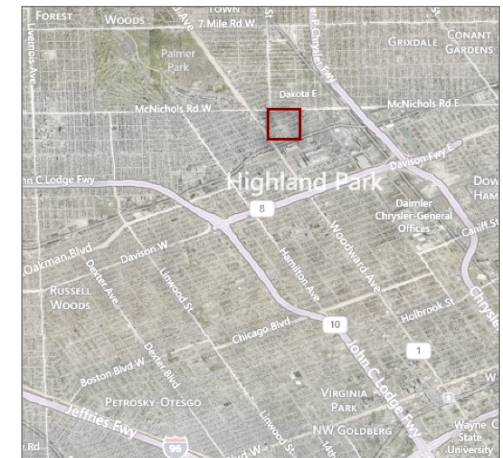


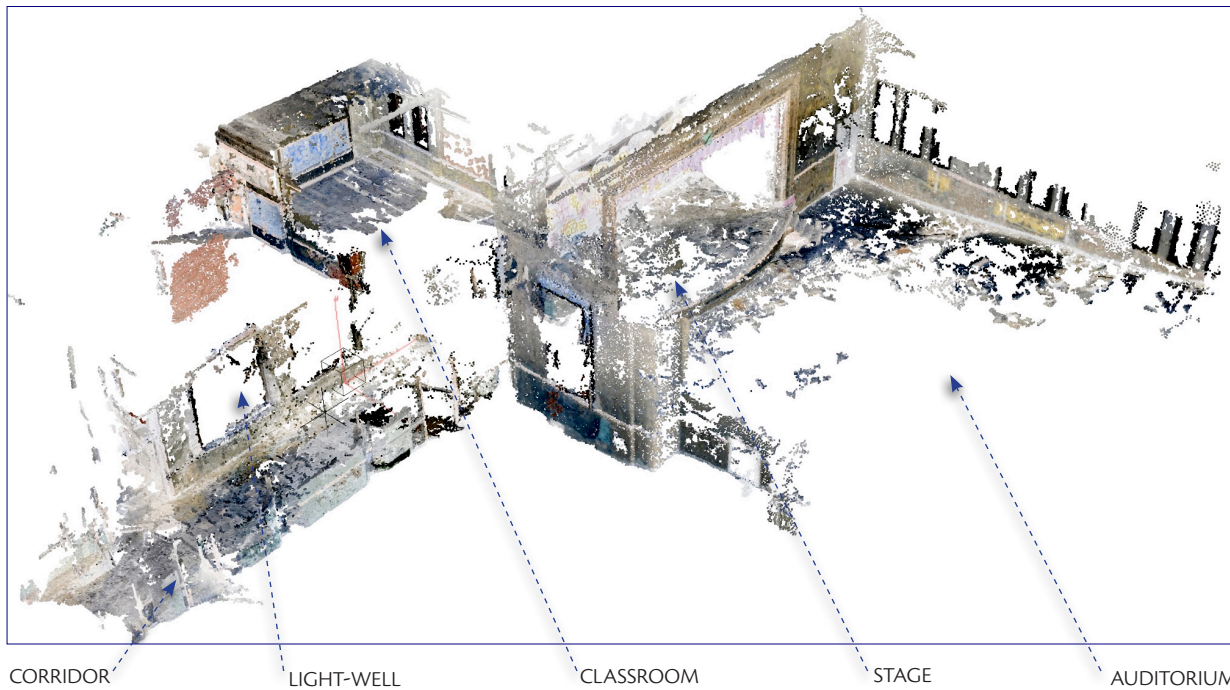


3D RECONSTRUCTIONS

We refined a technique to model 3D spaces from photographs. After a given space has been photographed from as many angles as possible, our software finds all points in common from which it then builds a 3D model.

Pictured here is the resulting point-cloud from a number of photographs (a sampling of which are below) of a classroom at the Greenfield Elementary School.



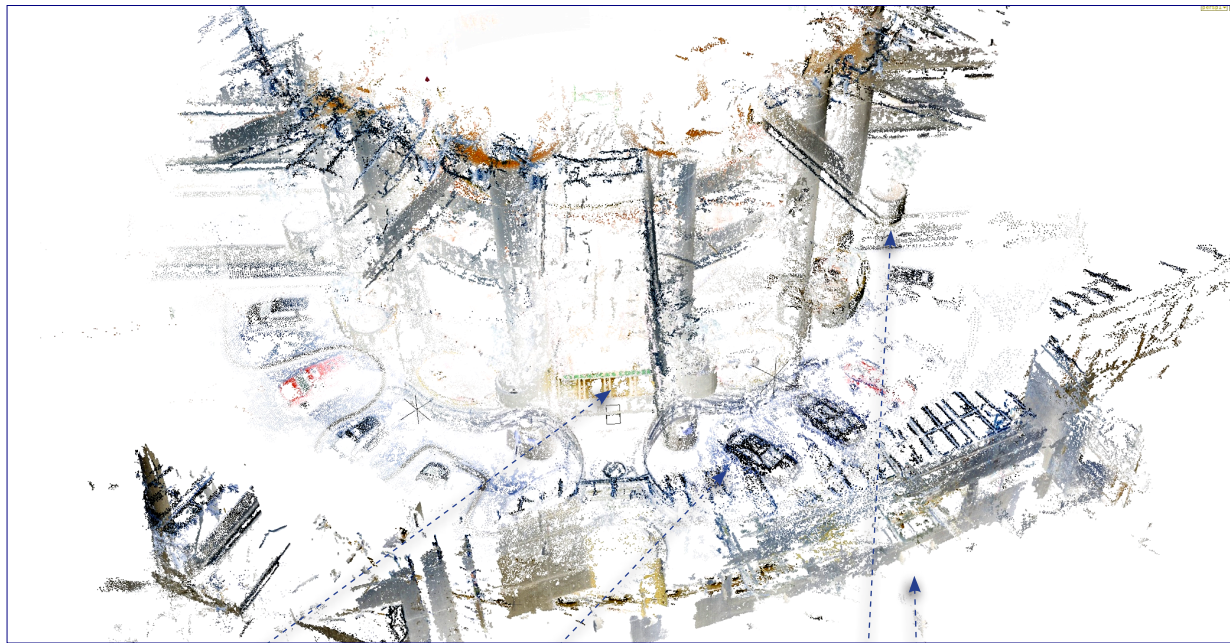


When viewed in 3D (rather than in 2D on this flat page), this technique is invaluable.

In this illustration, you see that the software has combined several spaces on two levels of the school, picturing them from an extrapolated angle that we could never otherwise obtain.

Photographs like the one below, from which the 3D space has been reconstructed, may be placed in the reconstruction from the exact angle and with the same framing as they were snapped.





LEVEL ONE: STARBUCKS

LEVEL A: GM SHOWROOM

LEVEL TWO: TREE PLANTERS

LEVEL TWO: CIRCULAR WALKWAY

In 3D this visualization allows you to make sense of the dizzying multiple levels of the Renaissance Center.



ELECTRO-MAGNETIC SAMPLING OF WIFI NETWORKS

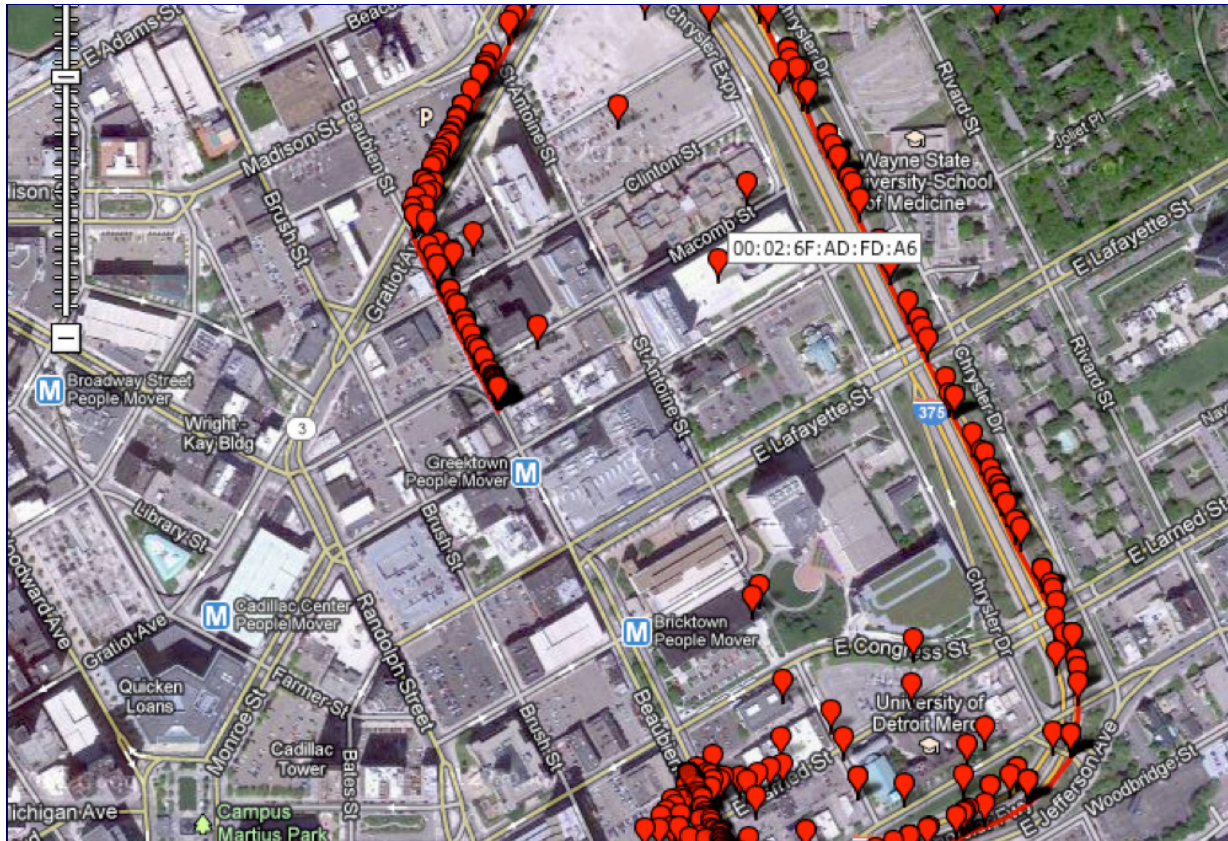
A good deal of presence and activity in contemporary life is invisible to the eye, and so in an attempt to register some of it along Brush Street, we attached an antenna to the top of our car, connecting it via Ethernet to a laptop computer, and captured for later analysis all the wireless packets we could detect along the way.

We tagged those packets with their respective GPS locations, the names of their networks, the strength of their signals, and a measure of their activity.

Though we have yet to process and analyze the full recording, we were struck at the time by two aspects:

first, that while such networks were concentrated most heavily where one would expect — downtown and midtown — they are present almost the entire length of Brush Street;

second, that the names given to the networks vividly evoked their neighborhoods, shifting from the corporate downtown to the folksy and imaginative further north.



ROUGH VISUALIZATION OF PRACTICE RUN DOWNTOWN

ARCHIVAL PRINTS

In addition to the Sanborn maps, we scanned numerous other prints and maps from the Bentley Historical Archive at the University of Michigan.

Here an 1887 print gives a bird's eye view of Detroit at that time, which can be aligned to the our helicopter survey.

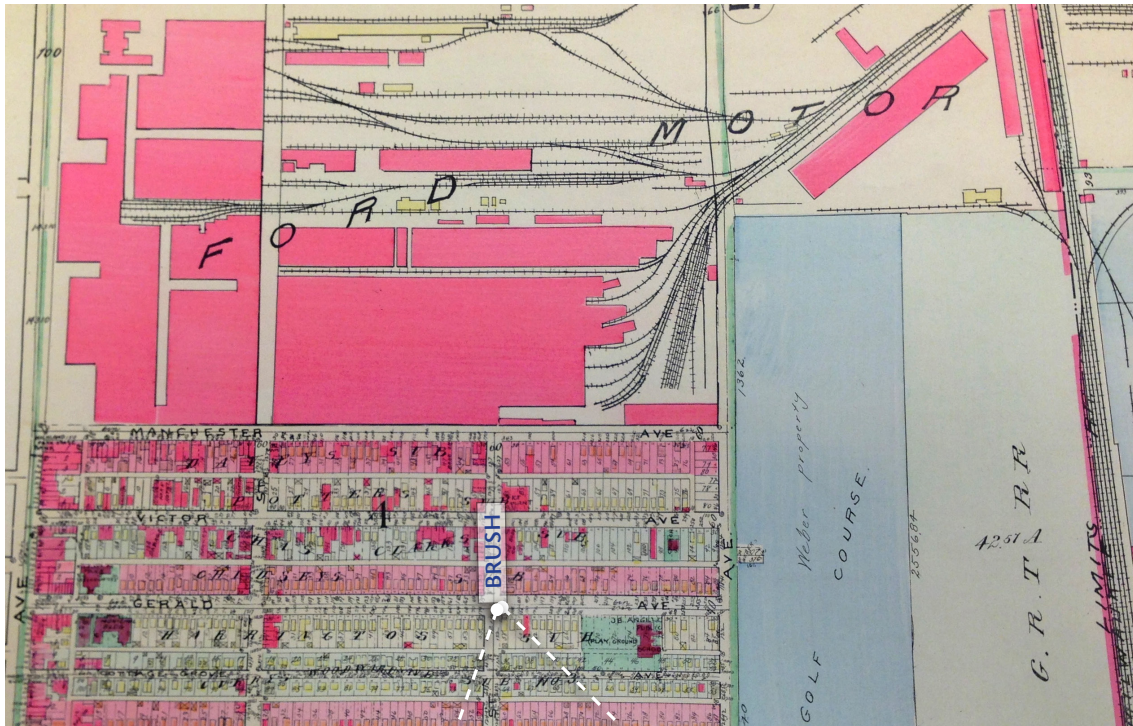


HIGHLAND PARK FORD PLANT VIEWS

Three views of the Highland Park Ford plant:

in its heyday, shown in a page from the Baist Real Estate Atlas, as rich an information source as the Sanborn insurance maps, which it complements;

and at present, captures from the helicopter and car surveys.



14 Barnard Ezra F
 15 De Wing J C, baths
 16 Hawes Robert M
 17 Dee Patrick
 18 Campbell Belle
 19 Brown Daniel
 20 Johnson Adelle, dress
 cutting school
 21 Fisher Henry C
 22 Fisher Margaret C
 23 Keiller Ella Cleveland
 24 Cushman Frank A
 25 Allison Russell G
 26 Bogart Daniel E
 27 Doerfler Martin
 28 Begg George
 29 Sprigings Lewis H
Witherell st (62) inter-
sects.
 30 Mitts Charles
 31 Jansen Gerhard G
 32 Desnoyer Mary
 33 Masson George†
 34 Stephenson Thomas J
 35 Hanley James
 36 Sayres Rev Wm S
 37 Horn John jr
 38 Vineburg Louis
 39 De Coteau Henry
 40 Vacant
 41 Petherick Wm W
 42 Withecomb Kate
 43 Moore George
 44 Brand Jacob, builder†
 45 Saulson Wm
 46 Fulwell Alfred†
 47 Chiera Gabriell†
 48 Beamer John

105 Lewis Seneca G
 " Fisher Ray
 107 Barton Harry C
 109 Vacant
 110 Hoffman S Benjamin
 111 Ginsburg Samuel†
 114 Rommeck Anton, gro-
 cer†
Brush st (358) inter-
sects.
 116 McGann T F, meats†
 " Perkins Henry
 119 Campbell Wm A
 120 Ruebelmann Marie E,
 dressmaker
 121 Murray Emma
 122 Hart Solomon
 123 Hollyer Samuel J
 125 Drywood John
 126 Pope John B
 127 Cowsky Benjamin
 128 Voigt Minnie
 130 Barnett Solomon
 131 Lichtenberg Yetta
 134 Fischer Louisa
 135 Brookes Arthur W
 139 Ruehle Charles W
 140 Vincent Warre B
 143 Smith Robert R
 144-146 J Calvert's Sons
 coal†
Beaubien st (350) inter-
sects.
 147 Varnbuhler John J
 148 Frankenstein Minnie
 " Beck Julius W
 " Sullivan Katherine L

POLK'S DETROIT CITY DIRECTORIES

The printed Detroit city directories are a rich trove of information from the analogue age, with volumes going containing Brush Street going back to 1895.

Entries are cross-listed by name and —remarkably — by address, allowing us to align them to our geographic grid and then to compare occupancies (often, *lives*) of the same lots over time.

6541 BRUSH STREET

Here, in a vacated stretch of the city just north of Milwaukee Junction (pictured below in our street capture), the directory entries tell a story common in Detroit.

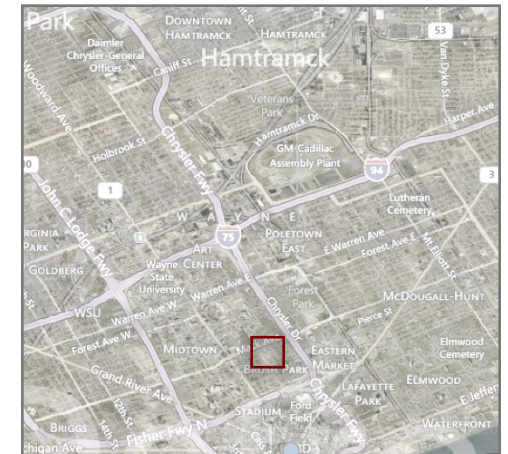
Examining a small apartment building at 6541 Brush Street and the two smaller lots south of it, we find 11 occupants in 1938, 5 in 1967, and none today.

1938

6527	Stallwood Albert
6529	Stallwood Delbert
6541-49	Apartments
bsmt	Timms Thos
1	Turley Wm
2	Shaw Robt D
3	Banush Chas
4	Lang Estelle
5	Adams Mildred Mrs
6	Veljacic V
7	Vacant
8	Davison Wm J
9	Diviney Thos

1967

6527	VACANT
6529	LE SEVRE MARTHA
6541	APARTMENTS
1	MOSS DAVID
2	NO RETURN
3	BOTTS EDITH MRS
4	VACANT
5	VACANT
6	STEPHENS EDDIE
7	VACANT
8	VACANT
9	SMITH LISA





GOOGLE STREETVIEW ALIGNMENT

Our car captures are all aligned with Google's street-view (with roughly twelve of our photos for every one of Google's).

Here is a startling example of discoveries to be made this way — what we took for an abandoned school (*see below*) had an intermediate existence as a facility for the Detroit police department (*as seen at left*).

This led us to discover the 2011 scandal behind this (*see next page*), which also showed that the Google imagery was more than three years old.



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Detroit's abandoned crime lab adds to a disturbing U.S. trend

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BY STEVE NEAVLING AND DETROIT FREE PRESS STAFF WRITERS

FILED UNDER Local News City Of Detroit

The stunning discovery of piles of evidence in a rotting old building last week put Detroit on a growing national list of crime labs accused in recent years of making big mistakes.

The Motor City joins labs in Houston, New York, North Carolina, Virginia and Washington plagued with similar problems.

" This is just another glaring example of what is now an epidemic in crime lab negligence," said Drew Findling, chairman of the Forensic Discipline Committee for the National Association of Criminal Defense Lawyers.

Of Detroit's lab fiasco, Findling said: "It's really one of the most shocking stories."

The Free Press discovered last week that evidence sat in a decaying old school for months, the remains of the city's crime lab that was ordered closed in 2008 because of shoddy police work. Among the rubble -- susceptible to thieves and vandals -- were thousands of rounds of live ammo, sealed evidence kits and case files.

The discovery is giving defense lawyers plenty of fodder to file appeals claiming tainted evidence.

However, legal experts note that the conditions of the evidence won't necessarily make it inadmissible in court.

" Obviously the defense is going to jump all over it, but a court could say, 'Tell that to a jury,' " said Richard Friedman, an evidence expert at the University of Michigan Law School. "There's also that possibility that a court would say, 'This just stinks too badly.' "

Unsecured Detroit police crime lab has legal experts calling for federal oversight

A chorus of legal experts and defense attorneys are now calling for federal oversight as fallout continues from last week's revelation that the Detroit police crime lab sat unsecured for months with evidence still inside.

They argue that a federal monitor should be assigned to oversee the situation, which is now expected to generate a wave of appeals by defense lawyers claiming tainted evidence.

The Free Press discovered last week that the crime lab --

Related Links

Detroit team methodically pores over rape kits

The murder that might never be solved: Evidence destroyed in unsolved '72 slaying

Ralph Godbee: Evidence not left behind at crime lab



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Prosecutor Worthy: Testing of 11,303 rape kits rescued from Detroit Crime Lab a long way off

By Gus Burns | gburns@mlive.com

September 21, 2012 at 7:40 AM, updated February 21, 2013 at 2:48 PM

DETROIT — After the Detroit Crime Lab closed in 2008, state police found 11,303 dusty rape kits upon the shelves.

Some of them had been there for decades, their contents — and the horror stories of the women who provided them — forgotten for years.

Kym Worthy

" I can't even speculate," Wayne County Prosecutor Kym Worthy said when asked how long it may take. "A long time... It's too depressing to think about how long it's going to take."

Worthy spoke about numerous problems crippling the Detroit justice system at a Wayne State University Seminar called, "City Under Siege: A University Forum on the Crime Crisis in Detroit."

Some in the crowd gasped when she spoke of the untested rape kits.

" We have usually a woman who was raped, they went to a police department to report their rape and they willingly went to a rape kit exam — so three- to four-hour extensive exam, literally every orifice of your body is looked at and scoped and examined — and hoping... we can get some DNA and hopefully that produces a trial," Worthy said.

She said 600 of the kits have been tested. The most recent "wave" of 200 resulted in the detection of 21 serial rapists among 153 test results.

One of the test kits contained DNA belonging to Shelly A. Brooks, 43, a serial rapist and killer arrested in 2006.

" Shelly A. Brooks killed and raped five more women after the date on this rape kit," Worthy said. "So that means if the rape kits were analyzed in a timely fashion perhaps, perhaps these five women would still be alive."

Shelly A. Brooks

Worthy said the Wayne County Prosecutor's Office has received \$2 million grant, not for testing, but for a collaborative "to come up with a national model of what you do when you find... untested rape kits" and "to change the culture of how sexual assault is prosecuted from the top to the bottom."

She said, although the State Police Crime Lab handles all other forensic testing on behalf of the Detroit Police Department, they cannot handle the rape kit backlog.

" They can't do them all because they're already overwhelmed," Worthy said.

The kits are being sent to private labs at a cost of \$1,200 to \$1,500 per kit, which equates to a total cost of more than \$13.5 million to test all 11,303.

Worthy said the county is seeking grants and other funding options to complete the testing.

Prosecutors have convicted one man based on the results of the kits tested so far, and another is set to go to trial soon, said Worthy.

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CRIME LAB COVERAGE

Counter-clockwise: coverage of the Crime Lab scandal on TV, in the newspaper, and on a website.

SUMMARY OF REMAINING WORK

1. COLLECTING

Still to be added to the spine of our work are these key 3D captures:

- a capture of the tide of suburbanites that wash in for baseball games, activating the surrounding blocks for a few hours before they retreat again, leaving the area as deserted as it was before.
- a re-capture of Brush Street from the front of a car, this time with a dual-unit fisheye camera set-up that will take in a wider expanse of the landscape in full 3D.
- a capture of the interior of the Highland Park Ford Plant, the most significant site that we have yet to gain entry. This is the most problematic area for us, for despite having been in contact several times with Ford's sympathetic corporate historian, no arrangements have yet materialized.

The first two of these captures will be completed in a return trip to Detroit on October 10–16, and perhaps, through renewed appeals and by some unforeseen stroke of luck, the third.

A certain amount of archival research and image gathering remains. While we have completed most of the essential research in the University of Michigan's Bentley and Maps Collections while we were artists-in-residence in Ann Arbor, there is more to be done in Detroit itself, where we have surveyed but not delved deeply into the remarkably extensive but poorly digitized Burton Collection of the main public library. In addition, there is image research to be done with the Detroit Free Press archives and the Wayne State archives.

There remains one last incomplete element, which is sound. Our 3D capture process was so demanding that our previous trips left little

time to capture voices and sound-scapes, though some of the material we did record is extraordinary (the fully rehearsed corporate tour-guides, male and female, whom we recorded on separate occasions in the Renaissance Center; the survivalist strategies and conspiracy theories of a man who spends much of his day biking or jogging north and south between downtown and the city limits, often on Brush Street; the forlorn sounds of dogs barking and distant trains whistling at the end of our line).

Even so, more time in Detroit could be crucial in filling out our audio library; again a question of budget.

2. CREATING

Though we've made small prototypes and proofs-of-concept, this is where our time and energy now goes. These are the key areas:

- final review, processing, and tagging of all 3D captures (color-correction, stereo alignment, automated computer vision analysis).
- final review, processing, and tagging of all audio captures.
- final review, processing, correlating, and tagging of all archival material (completion of maps alignment, spatial placement of historical prints and photographs, etc).
- design and programming of multimedia database.
- design and programming of main installation interface.*
- design and programming of web interface.
- dramaturgy and storyboards.
- programming and editing of "satellite" film projects.*

* see OUTCOMES section on following page.